

***New Pump and Treat Facility
Annual Operations Report,
October 2003 through
September 2004, Test Area
North Final Groundwater
Remedy, Operable Unit 1-07B***

**Idaho
Completion
Project**

Bechtel BWXT Idaho, LLC

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**New Pump and Treat Facility Annual Operations
Report, October 2003 through September 2004,
Test Area North Final Groundwater Remedy,
Operable Unit 1-07B**

**Idaho Completion Project
Idaho Falls, Idaho 83415**

**Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
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ABSTRACT

The New Pump and Treat Facility is a component of the groundwater remedy for a portion of a plume of dissolved volatile organic compounds in the Snake River Plain Aquifer beneath Test Area North, and is a facility located at the Idaho National Engineering and Environmental Laboratory. This report documents New Pump and Treat Facility operations during Fiscal Year 2004 (October 1, 2003–September 30, 2004). The New Pump and Treat Facility began routine operations on October 1, 2001, and continued operating through the end of Fiscal Year 2004. The New Pump and Treat Facility consists of three extraction wells, one injection well, two air strippers, and ancillary equipment (such as piping and monitoring equipment). Contaminated groundwater is pumped from the aquifer using one or more extraction wells, processed by air stripping to remove volatile organic compounds, and then injected back into the aquifer. During Fiscal Year 2004, the New Pump and Treat Facility met all operational goals. It was operational 99% of the time over the reporting period, the extraction flow rate was within prescribed limits during all operation periods, effluent concentration limits were met, and air discharge limits were not exceeded. Monitoring data show that influent contaminant concentrations have declined from 680 to 100 µg/L during the past 3 years of operation.

CONTENTS

ABSTRACT.....	iii
ACRONYMS.....	vii
1. INTRODUCTION.....	1-1
1.1 Overview of the New Pump and Treat Facility.....	1-1
2. SUMMARY OF OPERATIONS.....	2-1
2.1 Inspections, Operational Issues, and Corrective Maintenance.....	2-2
3. COMPLIANCE MONITORING EVALUATION.....	3-1
3.1 Influent Concentrations.....	3-1
3.2 Water Effluent Emissions	3-1
3.3 Air Emissions.....	3-1
3.3.1 Air Effluent Approach	3-2
3.3.2 Water Influent Approach	3-2
4. PERFORMANCE MONITORING EVALUATION.....	4-1
4.1 Plume Capture.....	4-1
4.2 Upgradient Source Control	4-3
4.3 Baseline Facility Performance	4-3
5. SUMMARY	5-1
5.1 Operations	5-1
5.2 Plume Capture.....	5-1
5.3 Upgradient Source Control	5-1
6. REFERENCES.....	6-1
Appendix A—Purge Water Management at the New Pump and Treat Facility, Fiscal Year 2004.....	A-1
Appendix B—Summary of Fiscal Year 2004 New Pump and Treat Facility Operations	B-1
Appendix C—Water Quality Data for New Pump and Treat Facility Influent, Effluent, and Air Emissions, Fiscal Year 2004	C-1
Appendix D—Water Quality Data for Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44	D-1

FIGURES

1-1.	Medial zone of the contaminated groundwater plume at Test Area North.....	1-2
2-1.	Flow rate from the New Pump and Treat Facility extraction wells.....	2-1
3-1.	Contaminant of concern concentrations in New Pump and Treat Facility influent.....	3-3
3-2.	Mass flow rate of volatile organic compounds discharged to the atmosphere by the New Pump and Treat Facility	3-4
4-1.	Medial zone capture zone	4-2
4-2.	Volatile organic compounds and strontium-90 concentrations at the TAN-29 well	4-4

TABLES

2-1.	New Pump and Treat Facility operations summary for Fiscal Year 2004.....	2-2
4-1.	Drawdown measured at selected wells	4-1

ACRONYMS

DCE	dichloroethene
DOE-ID	U.S. Department of Energy Idaho Operations Office
FY	fiscal year
GWTF	Groundwater Treatment Facility
INEEL	Idaho National Engineering and Environmental Laboratory
NPTF	New Pump and Treat Facility
OU	operable unit
PCE	tetrachloroethene
SP	sampling point
TAN	Test Area North
TCE	trichloroethene
TSF	Technical Support Facility
VC	vinyl chloride
VOC	volatile organic compound

New Pump and Treat Facility Annual Operations Report, October 2003 through September 2004, Test Area North Final Groundwater Remedy, Operable Unit 1-07B

1. INTRODUCTION

This Annual Operations Report documents Fiscal Year (FY) 2004 operations of the New Pump and Treat Facility (NPTF), which is operated as part of the Test Area North (TAN) Operable Unit 1-07B groundwater remedy at the Idaho National Engineering and Environmental Laboratory (INEEL), as described in the *Record of Decision for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites Final Remedial Action* (DOE-ID 1995). Although this Record of Decision was amended in September 2001 (DOE-ID 2001), the pump and treat portion of the remedy was not affected by the modification. The NPTF is operated in accordance with the *New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003a) and the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). Associated sampling of groundwater-monitoring wells in the vicinity is described in the *Sampling and Analysis Plan for the New Pump and Treat Facility Performance Monitoring Test Area North, Operable Unit 1-07B* (INEEL 2001). This Annual Operations Report provides information on the third year of NPTF operation, compliance, and performance, as required by the aforementioned documents.

The specific meanings of three terms used in this document are listed below:

- *Operations* refers to the routine activities associated with maintaining and running the NPTF
- *Compliance* refers to the NPTF being operated within air- and water-effluent discharge limits
- *Performance* refers to the function of the NPTF relative to requirements to clean up the medial zone of the groundwater plume and to capture the contaminated groundwater that emanates from the “hotspot” near the former TSF-05 injection well.

1.1 Overview of the New Pump and Treat Facility

The NPTF is a pump and treat system that is operated to clean up the medial zone of the groundwater plume and prevent the contaminated groundwater from migrating further downgradient (see Figure 1-1). Major components of the pump and treat system include (1) a network of groundwater extraction wells (i.e., TAN-38, TAN-39, and TAN-40), (2) an aboveground treatment system that uses two air strippers to reduce concentrations of volatile organic compounds (VOCs) to less than maximum contaminant levels, and (3) an injection well (i.e., TAN-53A) used to inject treated water back into the aquifer. Locations of the NPTF and surrounding wells are shown in Figure 1-1.



2. SUMMARY OF OPERATIONS

The NPTF began routine operations on October 1, 2001, and it has continued operating through September 30, 2004. During routine NPTF operations, contaminated groundwater is processed at a flow rate of 120 to 250 gpm. The actual flow rate of the NPTF during the reporting period is illustrated in Figure 2-1. The height of the area for each well corresponds to the extraction rate for that well, and the total height of the areas corresponds to the total flow rate. During the reporting period, the NPTF operated 99% of the time, which exceeded the uptime goal of 90%. Table 2-1 summarizes NPTF operations for each month in FY 2004.

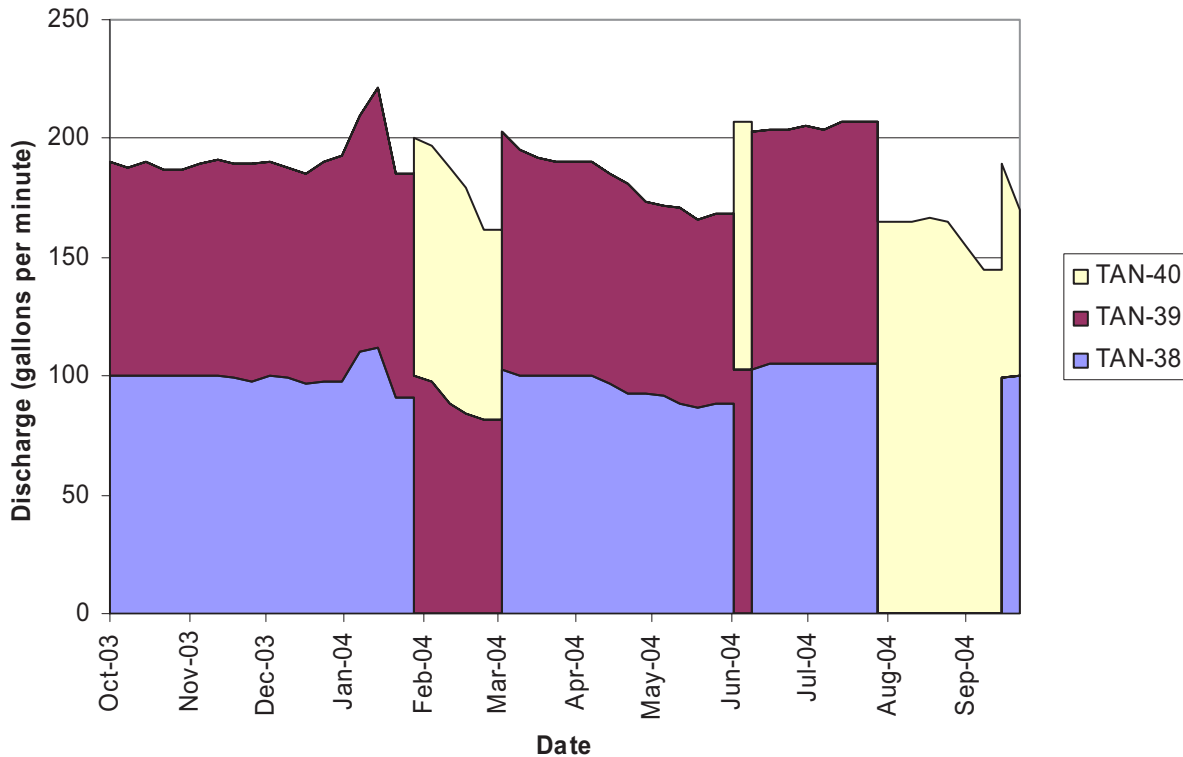


Figure 2-1. Flow rate from the New Pump and Treat Facility extraction wells.

In addition to processing contaminated groundwater taken from extraction wells, the NPTF processed purge water generated from groundwater sampling and well-drilling activities. All purge water was managed in accordance with applicable procedures. Appendix A summarizes the purge water processed through the NPTF during the reporting period.

Table 2-1. New Pump and Treat Facility operations summary for Fiscal Year 2004.

Period	Operating Hours		Gallons Processed	Monthly Uptime (%)	Rolling Average (12 months) Uptime (%)
	Possible	Actual			
October	672	672	7,899,780	100	98.1
November	504	495	6,299,117	98.2	98.7
December	840	830	7,210,058	98.8	98.6
January	840	840	12,207,546	100	98.6
February	672	671	9,382,414	99.9	98.7
March	696	689	9,054,403	99.0	98.7
April	648	648	9,372,020	100	98.8
May	672	636	10,712,417	94.6	99.1
June	840	840	6,957,825	100	99.2
July	840	840	7,337,727	100	99.2
August	672	672	7,057,043	100	99.3
September	1,008	984	9,649,928	97.6	99.0
Total FY 2004	8,904	8,817	104,971,063	—	99
Total FY 2003	8,712	8,550	103,140,278	—	98.1
Total FY 2002	8,736	8,568	119,259,910	—	98.1
Grand Total	26,352	25,935	327,371,251	—	98.4

FY = fiscal year

2.1 Inspections, Operational Issues, and Corrective Maintenance

The inspection requirements for the NPTF are described in Section 3.3 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). Inspections were performed daily throughout FY 2004 in accordance with applicable procedures.

The NPTF operated continuously throughout the reporting period, except for one unplanned and 11 planned shutdowns. The unplanned shutdown resulted from a general TAN power outage resulting from a raven flying into a transformer. Recovery from the unplanned shutdown was accomplished by restarting the NPTF. No other corrective maintenance was performed during the reporting period. Planned shutdowns occurred in order to support TAN power outages, maintain software, complete drawdown tests, and conduct annual facility testing (e.g., flow meter tests and tank water-level meter tests). Appendix B provides additional details about facility operations.

3. COMPLIANCE MONITORING EVALUATION

Compliance monitoring is conducted to ensure that the NPTF effluents meet water- and air-discharge limits and to track influent contaminant concentrations. During the reporting period, contaminant concentrations in water and air effluents were below discharge limits.

3.1 Influent Concentrations

The requirements for monitoring the concentration of contaminants in NPTF influent are shown in Table 4-1 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). The VOC and radionuclide concentrations measured in samples collected from the NPTF influent are shown in Figure 3-1. These data are tabulated in Appendix C. Generally, concentrations of VOCs in NPTF influent samples remained relatively constant with the exception of two spikes that occurred in January and August 2004 when the TAN-40 extraction pump was re-started after being on standby for several months. The January spike returned to a relatively constant value after 2 months of operation. The final FY 2004 influent sample showed a decreasing trend after 1 month of TAN-40 operation and is expected to return to a relatively constant value within 1 to 2 months. Radionuclide data are tabulated in Appendix C but were not plotted. Throughout the fiscal year, Sr-90 and H-3 were at or below detection limits, and no trend was discernible. The completeness for collection of NPTF influent samples was 100%. As a result of the relatively low concentration of contaminants in NPTF influent, a 2-year rebound study has been recommended for the NPTF (Wymore et al. 2004). Additional details concerning the rebound study can be found in the referenced document.

3.2 Water Effluent Emissions

The VOC and radionuclide concentrations in water discharged from the NPTF must be below maximum contaminant levels.^a Furthermore, the cumulative carcinogenic risk due to VOCs must be less than 1×10^{-5} .^b Tabulated contaminant concentration data for the NPTF effluent are shown in Appendix C. The NPTF effluent met water effluent discharge limits throughout FY 2004. The concentration of trichloroethene (TCE) and all other VOCs in NPTF effluent was below the method detection limit. As indicated in Appendix C of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b), contaminant concentrations less than the applicable method detection limit are not included in the cumulative risk calculation. As a result, the cumulative carcinogenic risk of NPTF effluent is zero for all samples collected. The concentrations of radionuclide contaminants of concern in NPTF effluent also were below the applicable maximum contaminant levels (see Appendix C). Hence, the water effluent was within acceptable limits during the reporting period.

3.3 Air Emissions

Limits for VOCs discharged from the NPTF to the atmosphere are described in the *New Pump and Treat Facility Remedial Design Test Area North Operable Unit 1-07B* (DOE-ID 2000). Sample collection, analysis, and validation requirements for monitoring air effluent are described in Table 4-1

a. Karl J. Dreher, Idaho Department of Water Resources, Letter to C. Stephen Allred, Idaho Department of Environmental Quality, April 3, 2001, "Injection of Amendments and Treated Ground Water into the Eastern Snake Plain Aquifer ('ESPA') in Support of Remedial Actions at Test Area North ('TAN') OU 1-07B, INEEL."

b. Brian R. Monson, Idaho Department of Environmental Quality, Letter to Dave Wessman, U.S. Department of Energy Idaho Operations Office, February 5, 2001, "August 8, 2001, and January 12, 2001, Request of a 'No Longer Contained-In' Determination for Operable Unit 1-07B Remediated Water at the INEEL, EPA ID No. ID4890008952."

of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b).

Concentrations of VOC contaminants of concern in NPTF air effluent remained relatively static throughout the reporting period (see Figure 3-2). Mass flow rates of VOCs discharged from the NPTF air strippers to the atmosphere were below the respective air discharge limits throughout the reporting period (see Figure 3-2). The VOC emissions from NPTF air strippers to the atmosphere were calculated in two ways. The first approach was to calculate the VOC mass flow rate using VOC concentrations measured in air stripper off-gas samples (the air effluent approach). The second approach was to assume that all VOCs dissolved in NPTF influent were discharged to the atmosphere and to calculate the VOC mass influx to the NPTF (the water influent approach). Comparison of results from two independent calculation methods provides an order of magnitude check on the calculations as the uncertainty associated with each measurement is $\pm 30\%$. Calculation results are included in Table C-10 in Appendix C.

3.3.1 Air Effluent Approach

The mass of VOCs discharged to the atmosphere from the air strippers was calculated as the product of measured VOC concentrations in samples collected from air stripper off-gas sample points and the volumetric flow rate of air discharged from the air strippers. The mass flow rates of TCE, tetrachloroethene (PCE), *cis*-1,2-dichloroethene (DCE), and vinyl chloride were below their respective discharge limits (see Figure 3-2). Vinyl chloride was not detected in any gaseous samples and is not included in Figure 3-2.

3.3.2 Water Influent Approach

If the air strippers in the NPTF were 100% efficient at transferring VOCs from water to air, then the mass flow rate of VOCs discharged to the atmosphere would equal the mass flow rate of VOCs dissolved in water entering the NPTF. Because the actual air stripper removal efficiency is somewhat less than 100%, the actual mass flow rate discharged to the atmosphere is less than the influent mass flow rate. Therefore, the influent VOC mass flow rate is an upper bound on the VOC mass flow rate discharged to the atmosphere. The VOC emissions from the NPTF to the atmosphere were calculated as the product of VOC concentrations measured at the influent sample point and the average monthly combined process flow rate shown in Figure 3-2.

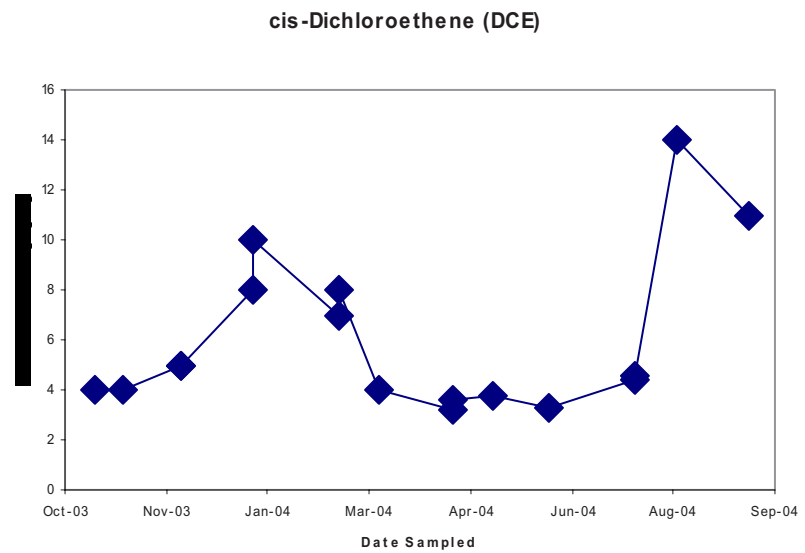
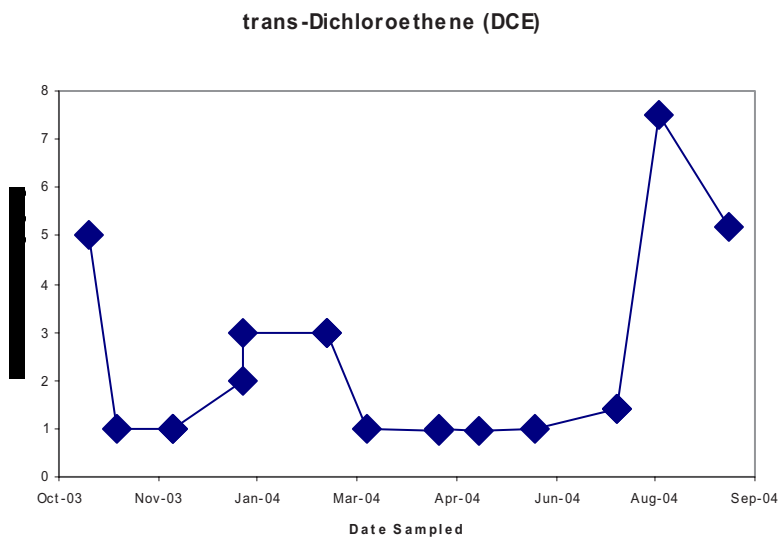
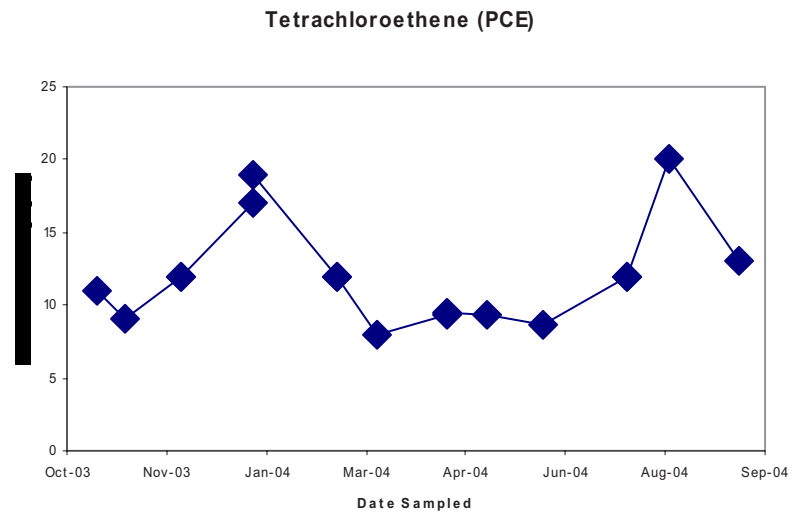
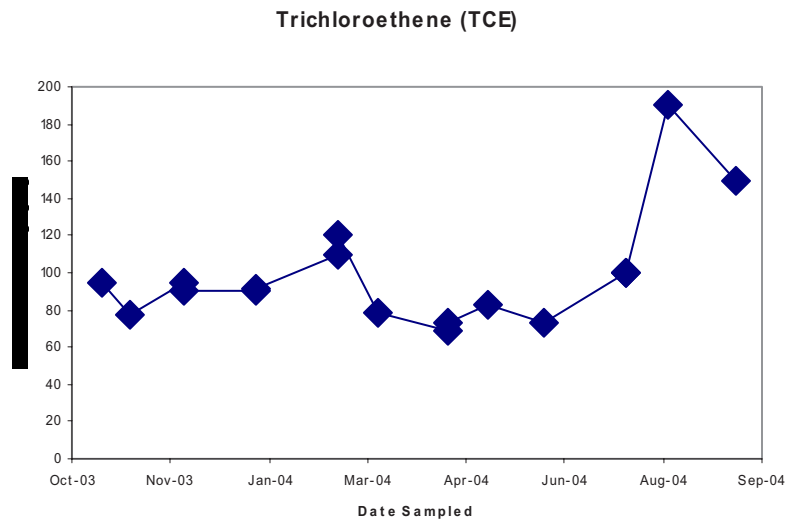


Figure 3-1. Contaminant of concern concentrations in New Pump and Treat Facility influent.

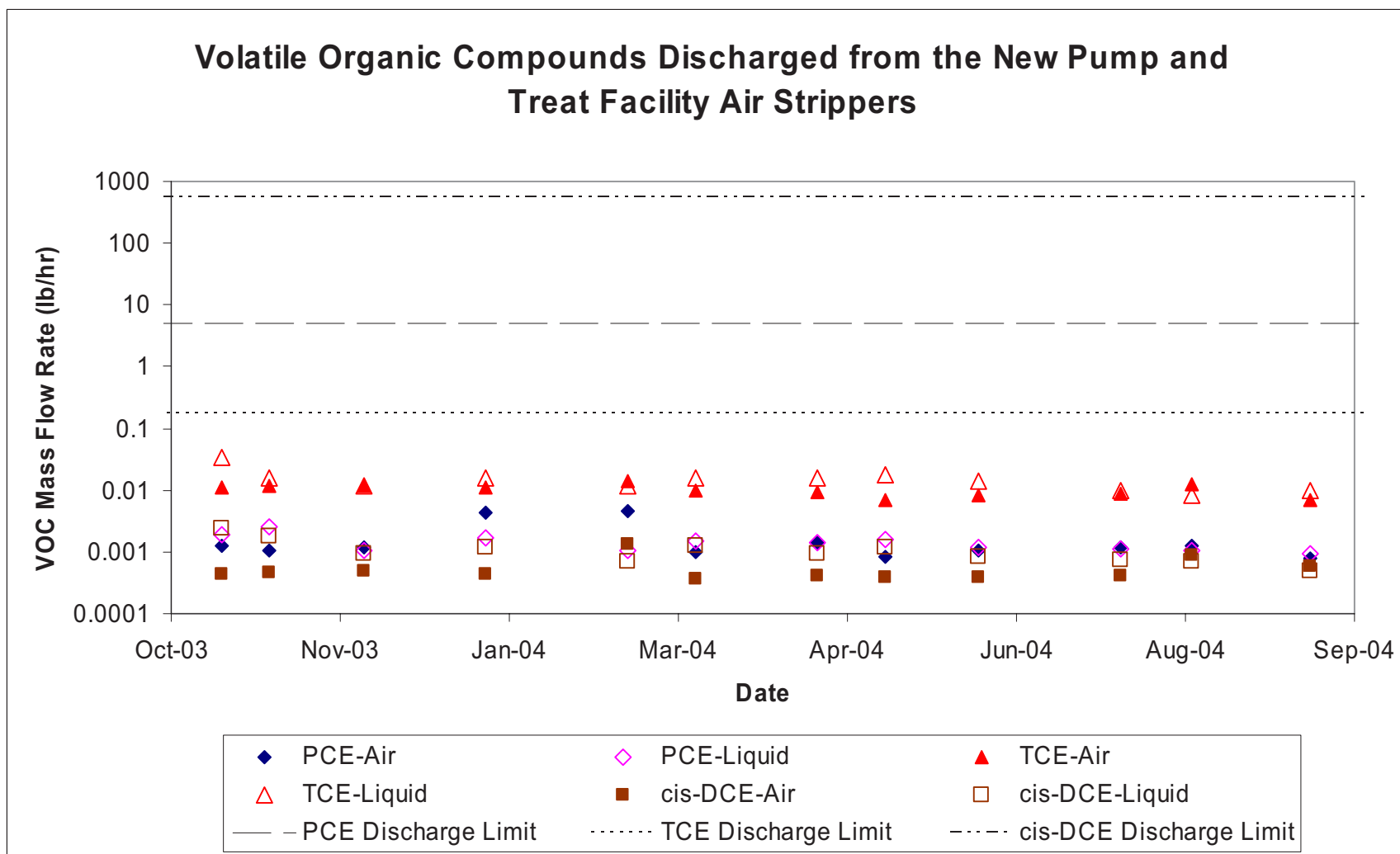


Figure 3-2. Mass flow rate of volatile organic compounds discharged to the atmosphere by the New Pump and Treat Facility.

4. PERFORMANCE MONITORING EVALUATION

This section addresses the effectiveness of extraction wells at generating a capture zone that encompasses the medial zone, temporal trends in contaminant of concern concentrations at the upgradient end of the medial zone, and baseline facility effectiveness. Baseline facility effectiveness includes the effect of groundwater remedies on contaminant of concern concentrations throughout the medial zone.

4.1 Plume Capture

This subsection evaluates the width of the capture zone generated by operating the TAN-38, TAN-39, and TAN-40 extraction wells. Performance requirements—both for generating the capture zone and for conducting tests to document the width of the capture zone—are described in Sections 4.2 and 4.2.1 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). As indicated in Table 2-3 of the Operations and Maintenance Plan, water level data from the TAN-19, TAN-32, TAN-33, and TAN-36 wells were evaluated to determine if sufficient drawdown continues to be achieved.

Water level data collected during planned shutdowns and subsequent startups were used to calculate the amount of drawdown at selected monitoring wells due to operating extraction wells. This analysis showed that the capture zone width met the requirement during both drawdown tests conducted during the reporting period. Wells included in this analysis (TAN-19, TAN-32, TAN-33, and TAN-36) are located near the edge of the minimum required capture zone (see Figure 4-1). The hydraulic response of these wells to changes in extraction flow rate as a result of starting extraction well pumps was interpreted to determine whether drawdown caused by operating the extraction wells occurred at these monitoring wells. Based on flow modeling conducted previously, measurable drawdown in these wells would indicate that the capture zone was at least as wide as required (INEEL 2003a, 2003b).

Results of drawdown testing are summarized in Table 4-1. Water levels responded from 0.7 to 1.8 cm when extraction well pumps were turned off or on. The response of water levels in these four wells to extraction well shutdown indicates that extraction wells cause drawdown at these monitoring wells and, thus, the capture zone extends at least as far as these wells. Therefore, it can be concluded that the extraction wells generate a capture zone that meets the requirement that the zone extend at least 225 ft from the medial zone centerline. Unfortunately, the water level transducer in TAN-33 was not functioning properly during the March 2004 drawdown test. However, the drawdown data from TAN-19 verify that drawdown occurred as required.

Table 4-1. Drawdown measured at selected wells.

NPTF Shutdown Date and Time	NPTF Startup Date and Time	Drawdown Observed during Startup (ft)				Post-Startup Extraction Rate (gpm)		
		TAN-19	TAN-32	TAN-33	TAN-36	TAN-38	TAN-39	TAN-40
03/1/04, 0935	03/1/04, 1520	0.05	0.06	—	0.06	103	100	0
09/15/04, 1200	09/15/04, 1400	0.023	0.04	0.04	0.03	99	0	90

NPTF = New Pump and Treat Facility
TAN = Test Area North

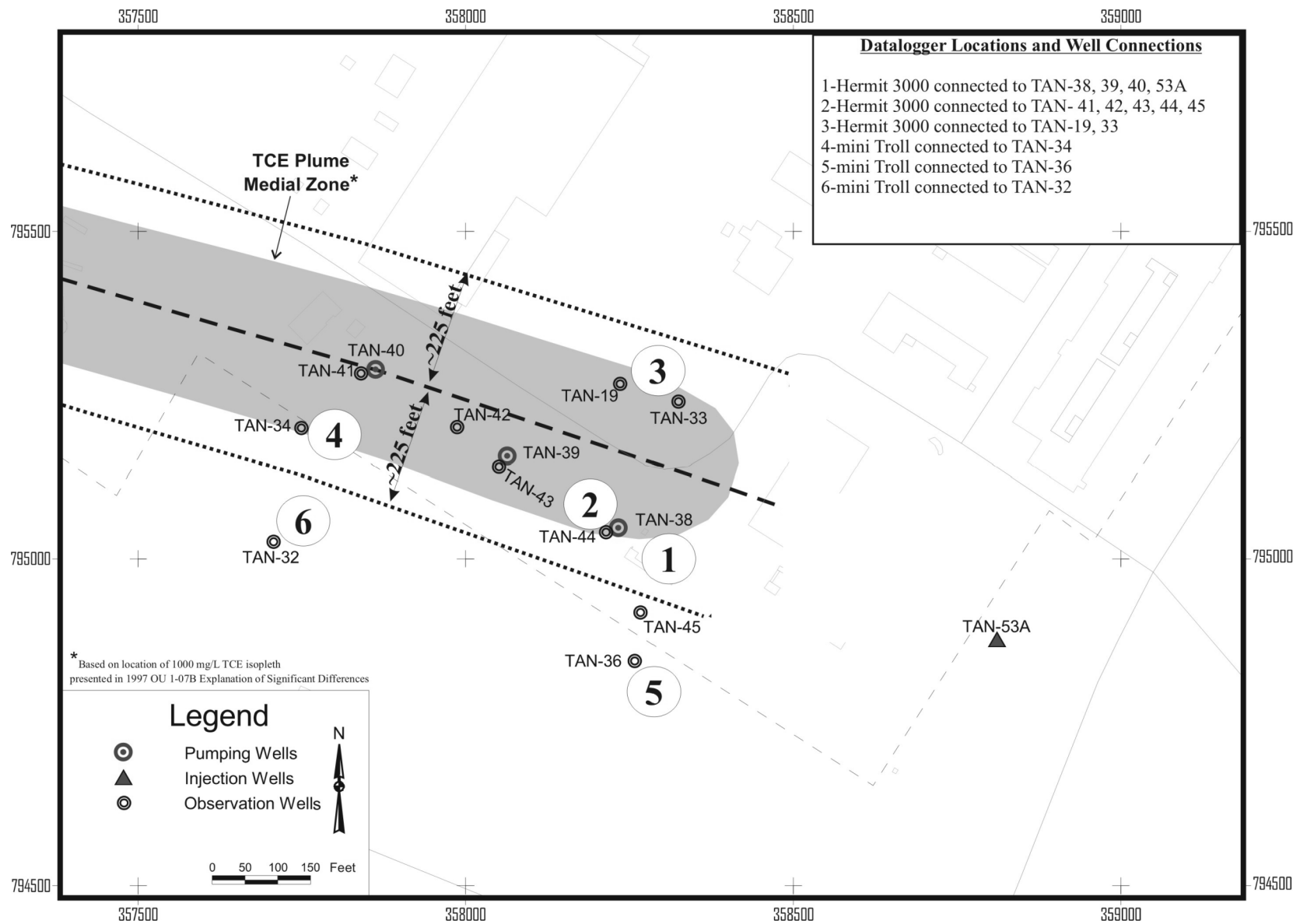


Figure 4-1. Medial zone capture zone.

4.2 Upgradient Source Control

Upgradient source control refers to monitoring the concentration of contaminants of concern upgradient of the extraction well network. The *New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003a) describes the required monitoring. The purpose of upgradient monitoring is primarily to provide a warning that groundwater with higher-than-anticipated contaminant concentrations is moving toward the extraction wells. Operational changes can then be made before this groundwater reaches the extraction well network.

The VOC and Sr-90 data for the TAN-29 well are shown in Figure 4-2 and are tabulated in Appendix D. As shown in Figure 4-2, the concentration of VOCs and Sr-90 in the TAN-29 well remained relatively constant during FY 2004. Annual sampling for Sr-90 in Well TAN-29 is required. However, additional samples were collected to support other project goals and objectives. One sample showed relatively low Sr-90 concentrations. However, this is an anomaly, as concentrations of both of the other samples are near historical levels.

The major objective of ongoing in situ bioremediation operations is to cut off flux of contaminants from the hotspot to downgradient wells. Once this in situ bioremediation objective is achieved, the concentration of VOCs in the TAN-29 well is expected to decrease. In addition, the VOC concentrations in the TAN-29 well remain below what they were before the hot-spot remedial action was initiated (e.g., TCE ranged from 1,000 to 1,600 µg/L before in situ bioremediation was implemented).

Based on the trends illustrated in Figure 4-2, there is no evidence that a body of water that has substantially higher contaminant concentrations than has been previously treated is moving toward the NPTF extraction wells. As a result, NPTF design limits will not be exceeded and no changes in NPTF operations are needed.

4.3 Baseline Facility Performance

Baseline facility performance refers to the effect of operating the NPTF on groundwater quality in selected wells near the NPTF and on the hydraulic performance of extraction and injection wells. Agency-approved controlling documents currently do not require water quality to be monitored in wells near the NPTF to assess NPTF performance. Nevertheless, this was done as a good operational practice. Monitoring was performed in accordance with the *Sampling and Analysis Plan for the New Pump and Treat Facility Performance Monitoring Test Area North, Operable Unit 1-07B* (INEEL 2001). Wells to be sampled were TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44.

The wells and parameters indicated above were sampled at the required frequency during this reporting period. The 90% completeness goal (INEEL 2001) was met for all analytes. Water quality monitoring data are tabulated in Appendix D. Data from these wells will be used during periodic reviews to assess the need for NPTF operations.

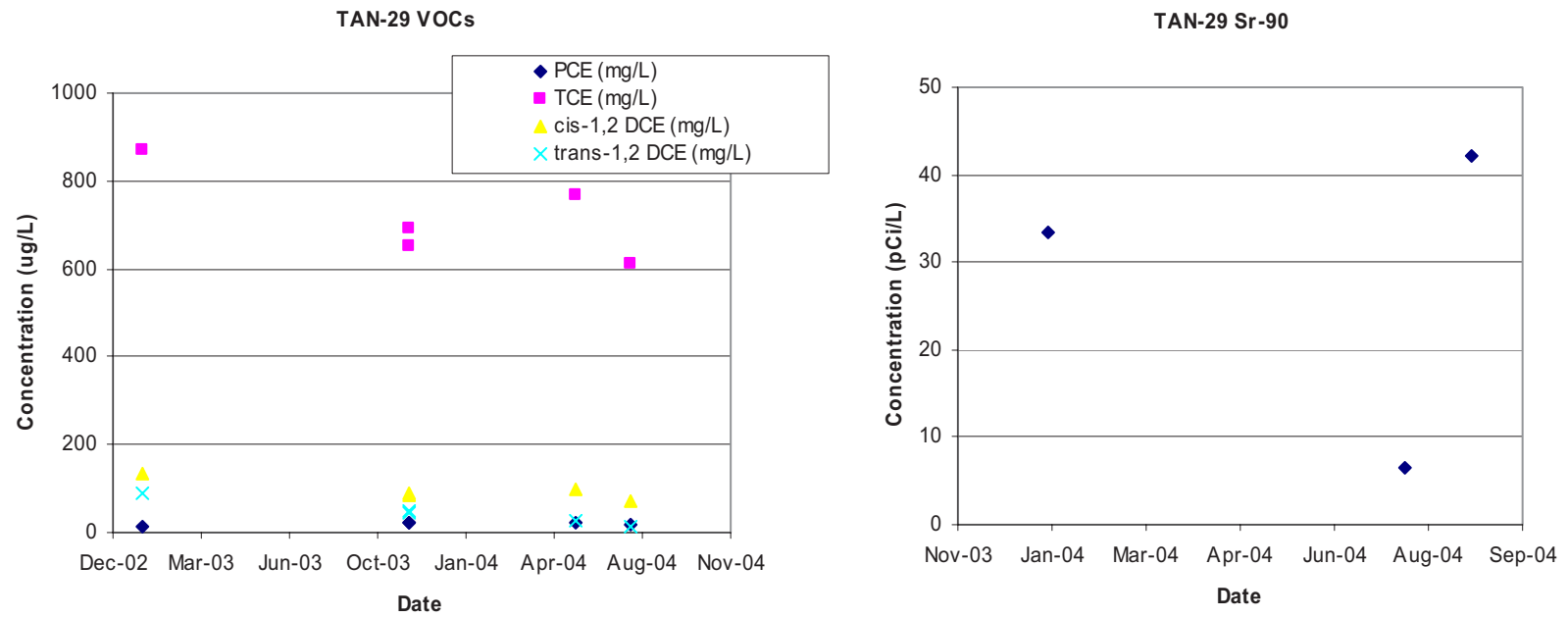


Figure 4-2. Volatile organic compounds and strontium-90 concentrations at the TAN-29 well.

5. SUMMARY

This section summarizes the findings of previous sections of this report.

5.1 Operations

The following pertains to operations:

- The NPTF operated within established limits throughout FY 2004. These limits include operational uptime, extraction well flow rate, and water and air discharge limits.
- Purge water processed by the NPTF during FY 2004 was handled in accordance with established procedures.
- Routine inspections were performed as required.
- The 90% completeness goal for performance sample collection and analysis was met. The 100% completeness goal for compliance sample collection was met.
- The NPTF operational uptime was greater than 99%, which met the uptime goal of at least 90%.
- Contaminant of concern concentrations in NPTF influent remained relatively constant during FY 2004 and are still approximately 10% of the design concentrations. As a result of these low concentrations, a 2-year rebound study is recommended (Wymore et al. 2004). A detailed description of the rebound study can be found in the *New Pump and Treat Facility Zone Rebound Test Plan, Operable Unit 1-07B, Test Area North* (Wymore et al. 2004).

5.2 Plume Capture

Water levels in several monitoring wells responded to extraction well startup (i.e., pumping from extraction wells caused drawdown at these monitoring wells). Drawdown in TAN-19, TAN-32, TAN-33, and TAN-36 indicates that the required plume capture width is achieved.

5.3 Upgradient Source Control

Concentrations of VOCs at TAN-29 remained relatively constant during FY 2004. As a result, no changes to the NPTF operating strategy are needed. In addition, radionuclide concentrations at TAN-29 remained steady in FY 2004.

6. REFERENCES

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- INEEL, 2003b, *Development and Calibration of a Steady-State Groundwater Flow Model for Capture Zone Evaluation, New Pump and Treat Facility, Test Area North, Operable Unit 1-07B*, INEEL/EXT-02-00661, Rev. 0, Idaho National Engineering and Environmental Laboratory, February 2003.
- Wymore R. A., L. N. Peterson, J. S. Rothermel, and L. O. Nelson, 2004, *New Pump and Treat Facility Medial Zone Rebound Test Plan, Operable Unit 1-07B, Test Area North*, ICP/EXT-04-00557, Revision 1, Idaho Completion Project, November 2004.

Appendix A

Purge Water Management at the New Pump and Treat Facility, Fiscal Year 2004

Appendix A

Purge Water Management at the New Pump and Treat Facility, Fiscal Year 2004

This appendix contains a summary of purge water processed through the New Pump and Treat Facility during Fiscal Year 2004. Table A-1 shows the month in which purge water was processed, the source of the purge water, the processing ratio, and the total volume of purge water processed during each month.

Table A-1. Purge water management.

Sampling Event Date	Wells Sampled (well identifier)	Processing ^a Ratio	Total Volume of Purge Water (gal)
10/2003	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	1,584
	TSF-05A & B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	200
11/2003	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1861, TAN-1860	100:1	528
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	179
12/2003	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-33, TAN-36, TAN-43, TAN-44, TAN-1860, TAN-1861	100:1	538
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	238
01/2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	576
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	218
February 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	360
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859; GWTF T3	500:1	360
March 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-33, TAN-36, TAN-43, TAN-44, TAN-1860, TAN-1861	100:1	468
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859; GWTF T2 and T3	500:1	1,097
April 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	345
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859; GWTF T1	500:1	450

Table A-1. (continued).

Sampling Event Date	Wells Sampled (well identifier)	Processing ^a Ratio	Total Volume of Purge Water (gal)
May 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	305
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859, GWTF T1	500:1	449
June 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	567
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	347
July 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	157
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	228
August 2004	TAN-16, TAN-51, TAN-52, TAN-54, TAN-55, TAN-57, TAN-21, ANP-08	N/A	886
	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	509
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	393
September 2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	396
	TSF-05A and B; TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	771

GWTF = Groundwater Treatment Facility

TAN = Test Area North

TSF = Technical Support Facility

a. The processing ratio is defined as the flow rate of the facility divided by the flow rate of the purge water being processed. Wells located outside of the hot spot area do not have a required processing ratio, and the ratio is indicated as N/A in the table.

Appendix B

Summary of Fiscal Year 2004 New Pump and Treat Facility Operations

Appendix B

Summary of Fiscal Year 2004 New Pump and Treat Facility Operations

The New Pump and Treat Facility operated continuously throughout the reporting period, except for instances of planned or unplanned shutdowns. Unplanned shutdowns were caused by power outages and spurious alarms. Planned shutdowns were performed to test or repair system components. Table B-1 contains a summary of all shutdowns, including any corrective actions taken and the amount of downtime caused by each shutdown.

Table B-1. Summary of New Pump and Treat Facility shutdowns during Fiscal Year 2004.

Date	Issue	Corrective Action	Downtime (hours)
10/20/03	The extraction pumps located in TAN-38, TAN-39, and TAN-40 were switched on and off to ensure that they were operating properly.	The facility was placed back into operation once the pumps were tested.	0.10
11/3/03	The facility shut down as a result of a planned TAN area power outage.	The facility was placed back into operation once the power came back on.	2.5
11/10/03	The facility shut down as a result of a planned TAN area power outage.	The facility was placed back into operation once the power came back on.	6.5
12/22/03	The facility shut down as a result of a planned TAN area power outage.	The facility was placed back into operation once the power came back on.	9.7
01/19/04	The facility was shut down to reset the control system.	The facility was placed back into operation once the control system had been reset.	0.1
02/02/04	The facility was shut down to perform a pressure gage calibration.	The facility was re-started once calibrations were completed.	1
03/01/04	The facility was shut down to support a required semiannual drawdown test.	The facility was re-started and the drawdown test was completed.	6.5
04/26/04	The facility shut down during an unplanned power outage at TAN caused by a raven flying into a transformer.	The facility was re-started as soon as electrical power was available.	35
05/11/04	The facility was shut down to complete system testing and calibration.	The facility was placed back in service at the completion of the tests.	1.1

Table B-1. (continued).

Date	Issue	Corrective Action	Downtime (hours)
07/26/04	The system was taken down to perform maintenance on the FIT-318 flow meter.	The facility was re-started when the maintenance was completed.	0.5
09/20/04	The facility was shut down as a result of a planned TAN power outage and to complete the biannual drawdown test measurement.	The system was re-started when electrical power was again available.	4.3
Total Down Time			67.3
Total Hours in Year			8,760
Calculated Uptime %			99.2%

TAN = Test Area North

Appendix C

Water Quality Data for New Pump and Treat Facility Influent, Effluent, and Air Emissions, Fiscal Year 2004

Appendix C

Water Quality Data for New Pump and Treat Facility Influent, Effluent, and Air Emissions, Fiscal Year 2004

Volatile organic compound and radionuclide concentrations measured in samples collected from the New Pump and Treat Facility influent sampling point (SP-1) and effluent sampling points (SP-2, SP-3, and SP-4) are tabulated in Tables C-1 through C-9. Results of air and liquid effluent rates from the NPTF are shown in Table C-10.

C-4

Sample Identifier	Date	Time	PCE		TCE		<i>trans</i> -DCE		<i>cis</i> -DCE		VC	
			(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag
NPT10001VE	10/21/03	930	11	—	95	—	5	U	4	J	5	U
NPT10601VE	11/04/03	1040	9	—	77	—	1	—	4	—	1	U
NPT11201VA	12/02/03	1030	12	—	95	—	1	—	5	—	1	U
NPT11202VA	12/02/03	1030	12	—	90	—	1	—	5	—	1	U
NPT11801VA	01/07/04	1000	17	—	90	D	2	—	8	—	1	U
NPT11802VA	01/07/04	1000	19	—	91	D	3	—	10	—	1	UJ
NPT12401VA	02/18/04	1125	12	—	110	—	3	—	7	—	1	U
NPT12402VA	02/18/04	1125	12	—	120	—	3	—	8	—	1	U
NPT13001VE	03/09/04	1050	8	—	78	J	1	—	4	—	1	U
NPT13601VA	04/14/04	900	9.4	—	69	—	0.97	J	3.2	—	1	U
NPT13602VA	04/14/04	900	9.5	—	73	—	1	—	3.6	—	1	U
NPT14201VE	05/04/04	1000	9.4	—	83	—	0.94	J	3.8	—	1	U
NPT14801VE	06/01/04	1000	8.7	—	73	—	0.99	J	3.3	—	1	U
NPT15401VA	07/13/04	1015	12	—	100	—	1.4	—	4.4	—	1	U
NPT15402VA	07/13/04	1015	12	—	100	D	1.4	—	4.6	—	1	U
NPT16001VE	08/03/04	1000	20	—	190	—	7.5	—	14	—	1	U
NPT16601VE	09/07/04	1430	13	—	150	D	5.2	—	11	—	1	U

DCE = dichloroethene
 PCE = tetrachloroethene
 TCE = trichloroethene
 VC = vinyl chloride
 D = diluted sample
 J = estimated value
 U = nondetect (half the detection limit is graphed)

Table C-2. New Pump and Treat Facility tritium influent data (SP-1).

Sample Identifier	Date	Time	H-3		
			(pCi/L)	+/-	Minimum Detectable Activity
NPT10001R8	10/21/03	930	2,030	153	357
NPT10601R8	11/04/03	1040	2,320	160	435
NPT11201R8	12/02/03	1030	2,200	158	409
NPT11202R8	12/02/03	1030	1,760	104	256
NPT11801R8	01/07/04	1000	2,420	141	248
NPT11802R8	01/07/04	1000	2,090	135	253
NPT12401R8	02/18/04	1125	2,290	98.6	186
NPT12402R8	02/18/04	1125	2,150	97.3	189
NPT13001R8	03/09/04	1050	2,370	139	338
NPT03601R8	04/14/04	900	1,580	106	273
NPT13602R8	04/14/04	900	1,760	106	263
NPT14201R8	05/04/04	1000	2,030	136	359
NPT14801R8	06/01/04	1000	1,980	121	305
NPT15401R8	07/13/04	1015	1,750	144	393
NPT15402R8	07/13/04	1015	1,760	132	353
NPT16001R8	08/03/04	1000	1,460	99.3	263
NPT16601R8	09/07/04	1430	1,740	104	258

Table C-3. New Pump and Treat Facility strontium-90 influent data (SP-1).

Sample Identifier	Date	Time	Sr-90			
			(pCi/L)	Flag	+/-	Minimum Detectable Activity
NPT10501RB	10/21/03	930	0.176	U	0.139	0.584
NPT11101RB	11/04/03	1040	-0.450	U	0.19	0.806
NPT11701RB	12/02/03	1030	-0.380	U	0.122	0.710
NPT12301RB	01/07/04	1000	0.0344	U	0.120	0.577
NPT12901RB	02/18/04	1125	-0.115	U	0.114	0.567
NPT13501RB	03/09/04	1050	-0.0905	U	0.147	0.671
NPT14101RB	04/14/04	900	-0.146	U	0.0956	0.522
NPT14701RB	05/04/01	1000	0.295	UJ	0.125	0.462
NPT15301RB	06/01/04	1000	-0.181	U	0.150	0.720
NPT15901RB	07/13/04	1015	-0.0406	U	0.160	0.809
NPT16501RB	08/03/04	1000	0.271	—	0.175	0.716
NPT17101RB	09/07/04	1430	0.122	—	0.0903	0.369

J = estimated value
 U = nondetect

Table C-4. New Pump and Treat Facility gross alpha influent (SP-1) and effluent (SP-2) data.

Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Alpha Count Date	Total Background Counts	Background (cpm)	Total Source Counts	Source (cpm)	Efficiency Factor (cpm/dpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Alpha (pCi/L)	Sample Activity (pCi)
NPT10101AB	10/21/03	930	SP-2	11/11/03	108	2.16	256,617	5,132.34	0.30	73	1.46	-0.7 +/- 0.54	-35.16 +/- 27.03	-0.04
NPT10102AB	10/21/03	930	SP-2	11/11/03	108	2.16	256,617	5,132.34	0.30	69	1.38	-0.78 +/- 0.53	-39.18 +/- 26.73	-0.04
NPT10001AB	10/21/03	930	SP-1	11/11/03	108	2.16	256,617	5,132.34	0.30	80	1.6	-0.56 +/- 0.55	-28.13 +/- 27.55	-0.03
NPT10601AB	11/04/03	1040	SP-1	11/11/03	108	2.16	256,617	5,132.34	0.30	86	1.72	-0.44 +/- 0.56	-22.10 +/- 27.99	-0.02
NPT10701AB	11/04/03	1040	SP-2	11/11/03	108	2.16	256,617	5,132.34	0.30	140	2.8	0.64 +/- 0.63	32.15 +/- 31.64	0.03
NPT10702AB	11/04/03	1040	SP-2	11/11/03	108	2.16	256,617	5,132.34	0.30	78	1.56	-0.6 +/- 0.55	-30.14 +/- 27.40	-0.03
NPT11201AB	12/02/03	1030	SP-1	12/09/03	32	0.64	254,870	5,097.40	0.30	19	0.38	-0.26 +/- 0.29	-13.15 +/- 14.44	-0.01
NPT11202AB	12/02/03	1030	SP-1	12/09/03	32	0.64	254,870	5,097.40	0.30	28	0.56	-0.08 +/- 0.31	-4.04 +/- 15.67	0.00
NPT11301AB	12/02/03	1030	SP-2	12/09/03	32	0.64	254,870	5,097.40	0.30	9	0.18	-0.46 +/- 0.26	-23.26 +/- 12.95	-0.02
NPT11801AB	01/07/04	1000	SP-1	01/14/04	15	0.3	251,698	5,033.96	0.29	55	1.1	0.8 +/- 0.33	40.96 +/- 17.13	0.04
NPT11802AB	01/07/04	1000	SP-1	01/14/04	15	0.3	251,698	5,033.96	0.29	22	0.44	0.14 +/- 0.24	7.17 +/- 12.46	0.01
NPT11901AB	01/07/04	1000	SP-2	01/14/04	15	0.3	251,698	5,033.96	0.29	25	0.5	0.2 +/- 0.25	10.24 +/- 12.95	0.01
NPT12401AB	02/18/04	1125	SP-1	03/23/04	8	0.16	252,123	5,042.46	0.29	12	0.24	0.08 +/- 0.18	4.09 +/- 9.14	0.00
NPT12402AB	02/18/04	1125	SP-1	03/23/04	8	0.16	252,123	5,042.46	0.29	16	0.32	0.16 +/- 0.20	8.18 +/- 10.02	0.01
NPT12501AB	02/18/04	1125	SP-2	03/23/04	8	0.16	252,123	5,042.46	0.29	14	0.28	0.12 +/- 0.19	6.13 +/- 9.59	0.01
NPT13001AB	03/09/04	1050	SP-1	03/23/04	8	0.16	252123	5,042.46	0.29	6	0.12	-0.04 +/- 0.15	-2.04 +/- 7.65	0.00
NPT13101AB	03/09/04	1050	SP-2	03/23/04	8	0.16	252,123	5,042.46	0.29	8	0.16	0 +/- 0.16	0.00 +/- 8.18	0.00
NPT13102AB	03/09/04	1050	SP-2	03/23/04	8	0.16	252,123	5,042.46	0.29	5	0.1	-0.06 +/- 0.14	-3.07 +/- 7.37	0.00
NPT13601AB	04/14/04	900	SP-1	06/14/04	6	0.12	232,377	4,647.54	0.27	22	0.44	0.32 +/- 0.21	17.74 +/- 11.74	0.02
NPT13602AB	04/14/04	900	SP-1	06/14/04	6	0.12	232,377	4,647.54	0.27	14	0.28	0.16 +/- 0.18	8.87 +/- 9.92	0.01
NPT13701AB	04/14/04	900	SP-2	06/15/04	4	0.08	223,257	4,465.14	0.26	14	0.28	0.2 +/- 0.17	11.54 +/- 9.79	0.01
NPT14201AB	05/04/04	1000	SP-1	06/15/04	4	0.08	223,257	4,465.14	0.26	6	0.12	0.04 +/- 0.13	2.31 +/- 7.30	0.00
NPT14301AB	05/04/04	1000	SP-2	06/15/04	4	0.08	223,257	4,465.14	0.26	14	0.28	0.2 +/- 0.17	11.54 +/- 9.79	0.01
NPT14302AB	05/04/04	1000	SP-2	06/15/04	4	0.08	223,257	4,465.14	0.26	5	0.1	0.02 +/- 0.12	1.15 +/- 6.93	0.00
NPT14801AB	06/01/04	1000	SP-1	06/16/04	2	0.04	248,123	4,962.46	0.29	9	0.18	0.14 +/- 0.13	7.27 +/- 6.89	0.01
NPT14901AB	06/01/04	1000	SP-2	06/16/04	2	0.04	248,123	4,962.46	0.29	21	0.42	0.38 +/- 0.19	19.73 +/- 9.96	0.02
NPT14902AB	06/01/04	1000	SP-2	06/16/04	2	0.04	248,123	4,962.46	0.29	6	0.12	0.08 +/- 0.11	4.15 +/- 5.88	0.00
NPT15501AB	07/13/04	1015	SP-2	08/02/04	1	0.02	253,047	5,060.94	0.29	34	0.68	0.66 +/- 0.24	33.61 +/- 12.05	0.03
NPT15401AB	07/13/04	1015	SP-1	08/02/04	1	0.02	253,047	5,060.94	0.29	20	0.4	0.38 +/- 0.18	19.35 +/- 9.33	0.02
NPT15402AB	07/13/04	1015	SP-1	08/02/04	1	0.02	253,047	5,060.94	0.29	13	0.26	0.24 +/- 0.15	12.22 +/- 7.62	0.01
NPT16001AB	08/03/04	1000	SP-1	08/17/04	2	0.04	251,229	5,024.58	0.29	9	0.18	0.14 +/- 0.13	7.18 +/- 6.80	0.01
NPT16101AB	08/03/04	1000	SP-2	08/17/04	2	0.04	251,229	5,024.58	0.29	24	0.48	0.44 +/- 0.20	22.57 +/- 10.46	0.02
NPT16102AB	08/03/04	1000	SP-2	08/17/04	2	0.04	251,229	5,024.58	0.29	10	0.2	0.16 +/- 0.14	8.21 +/- 7.11	0.01

Table C-4. (continued).

Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Alpha Count Date	Total Background Counts	Background (cpm)	Total Source Counts	Source (cpm)	Efficiency Factor (cpm/dpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Alpha (pCi/L)	Sample Activity (pCi)
NPT16601AB	09/07/04	1430	SP-1	09/20/04	23	0.46	256,726	5,134.52	0.30	20	0.4	-0.06 +/- 0.26	-3.01 +/- 13.17	0.00
NPT16701AB	09/07/04	1430	SP-1	09/20/04	23	0.46	256,726	5,134.52	0.30	25	0.5	0.04 +/- 0.28	2.01 +/- 13.91	0.00
NPT16702AB	09/07/04	1430	SP-2	09/20/04	23	0.46	256,726	5,134.52	0.30	9	0.18	-0.28 +/- 0.23	-14.05 +/- 11.36	-0.01
cpm = counts per minute dpm = disintegrations per minute														

Table C-5. New Pump and Treat Facility volatile organic compound air effluent data.

SP-3-A-311												
Sample Identifier	Date	Time	PCE		TCE		<i>cis</i> -DCE		<i>trans</i> -DCE		VC	
			(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag
NPT10201VT	10/21/03	930	30	—	370	—	19	—	5	—	15.0	U
NPT10801VT	11/04/03	1040	29	—	430	—	21	—	5	—	1.0	U
NPT11401VT	12/02/03	1030	32	—	400	—	23	—	6	—	2.0	U
NPT12001VT	01/07/04	1000	53	—	400	—	20	—	5	—	1.0	U
NPT12601VT	02/18/04	1125	170	—	480	—	77	—	11	—	2.0	U
NPT13201VT	03/09/04	1050	23	—	290	—	15	—	4	J	15.0	U
NPT13801VT	04/14/04	900	34	—	290	—	17	—	5.2	U	5.2	U
NPT14401VT	05/04/04	1000	20	—	220	—	16	—	8.2	U	8.2	U
NPT15001VT	06/01/04	1000	26	—	260	—	17	—	4.9	U	4.9	U
NPT15601VT	07/13/04	1015	27	—	260	—	17	—	6.6	U	6.6	U
NPT16201VT	08/03/04	1000	33	—	400	—	39	—	16	—	6.6	U
NPT16801VT	09/07/04	1430	21	—	240	—	27	—	9.9	—	6.7	U
SP-4-A-310												
Sample Identifier	Date	Time	PCE		TCE		<i>cis</i> -DCE		<i>trans</i> -DCE		VC	
			(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag
NPT10301VT	10/21/03	930	18	—	190	—	10	J	16	U	16.0	U
NPT10901VT	11/04/03	1040	12	—	160	—	9	—	2	—	1.0	U
NPT11501VT	12/02/03	1030	13	—	180	—	9	—	2	—	1.0	U
NPT12101VT	01/07/04	1000	120	—	140	—	9	—	2	—	1.0	U
NPT12701VT	02/18/04	1125	12	—	210	—	13	—	4	—	2.0	UJ
NPT13301VT	03/09/04	1050	16	—	190	—	10	J	15	U	15.0	U
NPT13901VT	04/14/04	900	20	—	160	—	10	—	2.6	U	2.6	U
NPT14501VT	05/04/04	1000	12	—	130	—	9.9	—	8.4	U	8.4	U
NPT15101VT	06/01/04	1000	14	—	140	—	8.9	—	4.9	U	4.9	U
NPT15701VT	07/13/04	1015	18	—	180	—	11	—	6.6	U	6.6	U
NPT16301VT	08/03/04	1000	17	—	220	—	21	—	7.9	—	6.7	U
NPT16901VT	09/07/04	1430	9.8	—	110	—	12	—	3	U	6.9	U

DCE = dichloroethene
 PCE = tetrachloroethene
 TCE = trichloroethene
 VC = vinyl chloride

D = diluted sample
 U = nondetect (half the detection limit is graphed)
 J = estimated value

Table C-6. New Pump and Treat Facility volatile organic compound water effluent data.

SP-2 Total Effluent												
Sample Identifier	Date	Time	PCE		TCE		<i>trans</i> -DCE		<i>cis</i> -DCE		VC	
			(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag
NPT10101VA	10/21/03	930	1	U	1	U	1	U	1	U	1	U
NPT10102VA	10/21/03	930	1	U	1	U	1	U	1	U	1	U
NPT10701VA	11/04/03	1040	1	U	1	U	1	U	1	U	1	U
NPT10702VA	11/04/03	1040	1	U	1	U	1	U	1	U	1	U
NPT11301VE	12/02/03	1030	1	U	0.07	J	1	U	1	U	1	U
NPT11901VE	01/07/04	1000	1	U	0.2	J	1	U	1	U	1	U
NPT12501VE	02/18/04	1125	1	U	0.7	J	1	U	1	U	1	U
NPT13101VA	03/09/04	1050	1	U	0.2	J	1	U	1	U	1	U
NPT13102VA	03/09/04	1050	1	U	1	U	1	U	1	U	1	U
NPT13701VE	04/14/04	900	1	U	1	U	1	U	1	U	1	U
NPT14301VE	05/04/04	1000	1	U	1	U	1	U	1	U	1	U
NPT14302VE	05/04/04	1000	1	U	1	U	1	U	1	U	1	U
NPT14901VA	06/01/04	1000	1	U	1	U	1	U	1	U	1	U
NPT14902VA	06/01/04	1000	1	U	1	U	1	U	1	U	1	U
NPT15501VT	07/13/04	1015	1	U	1	U	1	U	1	U	1	U
NPT16101VA	08/03/04	1000	1	U	1	U	1	U	1	U	1	U
NPT16102VA	08/03/04	1000	1	U	1	U	1	U	1	U	1	U
NPT16701VA	09/07/04	1430	1	U	1	U	1	U	1	U	1	U
NPT16702VA	09/07/04	1430	1	U	1	U	1	U	1	U	1	U

DCE = dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
VC = vinyl chloride
D = diluted sample
J = estimated value
U = nondetect (half the detection limit is graphed)

Table C-7. New Pump and Treat Facility tritium effluent data.

SP-2, Total Effluent					
Sample Identifier	Date	Time	(pCi/L)	+/-	Minimum Detectable Amount
NPT10101R8	10/21/03	930	2,100	154	355
NPT10102R8	10/21/03	930	2,000	155	366
NPT10701R8	11/04/03	1040	2,430	142	359
NPT10701R8	11/04/03	1040	2,210	140	363
NPT11301R8	12/02/03	1030	1,790	112	280
NPT11901R8	01/07/04	1000	2,260	142	260
NPT12501R8	02/18/04	1125	2,200	94.6	179
NPT13101R8	03/09/04	1050	2,230	138	339
NPT13102R8	03/09/04	1050	1,820	116	290
NPT03701R8	04/14/04	900	1,680	113	291
NPT14301R8	05/04/04	1000	2,150	139	364
NPT14302R8	05/04/04	1000	2,100	136	356
NPT14901R8	06/01/04	1000	1,980	123	311
NPT14902R8	06/01/04	1000	1,890	120	304
NPT15501R8	07/13/04	1015	1,870	111	277
NPT16101R8	08/03/04	1000	1,370	97.3	260
NPT16102R8	08/03/04	1000	1,600	108	287
NPT16701R8	09/07/04	1430	1,790	103	253
NPT16702R8	09/07/04	1430	1,970	111	270

Table C-8. New Pump and Treat Facility strontium-90 effluent data.

SP-2, Total Effluent						
Sample Identifier	Date	Time	(pCi/L)	Flag	+/-	Minimum Detectable Limit
NPT10101RB	10/21/03	930	0.373	UJ	0.143	0.515
NPT10102RB	10/21/03	930	0.202	U	0.138	0.566
NPT10701RB	11/04/03	1040	0.309	U	0.170	0.646
NPT10702RB	11/04/03	1040	0.0444	U	0.189	0.777
NPT11301RB	12/02/03	1030	-0.144	U	0.0816	0.710
NPT11901RB	01/07/04	1000	0.124	—	0.120	0.528
NPT12501RB	02/18/04	1125	0.388	UJ	0.142	0.511
NPT13101RB	03/09/04	1050	0.395	UJ	0.157	0.587
NPT13102RB	03/09/04	1050	0.216	U	0.125	0.503
NPT03701RB	04/14/04	900	-0.0196	U	0.0882	0.447
NPT14301RB	05/04/04	1000	0.109	U	0.0702	0.294
NPT14302RB	05/04/04	1000	0.0165	U	0.125	0.518
NPT14901RB	06/01/04	1000	-0.259	U	0.176	0.827
NPT14902RB	06/01/04	1000	0.0532	U	0.137	0.601
NPT15501RB	07/13/04	1015	-0.0641	U	0.164	0.825
NPT16101RB	08/03/04	1000	0.447	—	0.183	0.663
NPT16102RB	08/03/04	1000	0.247	—	0.160	0.655
NPT06701RB	09/07/04	1430	0.931	—	0.213	0.507
NPT06702RB	09/07/04	1430	0.665	—	0.169	0.456

J = estimated value
U = nondetect

Table C-9. New Pump and Treat Facility gross beta influent (SP-1) and effluent (SP-2) data.

Sample Identifier	Sample Collection Date	Sample Collection Time	Sample Location	Beta Count Date	Total Background Counts	Background (cpm)	Total Source Counts	Source (cpm)	Efficiency Factor (cpm/dpm)	Total Sample Counts	Sample (cpm)	Net Sample Activity or Net Count Rate (cpm)	Gross Beta (pCi/L)	Sample Activity (pCi)
NPT10101AB	10/21/03	930	SP-2-NPTF	11/11/03	1,537	30.74	108,293	2,165.86	0.20	1,510	30.2	-0.54 +/- 2.21	-41.42 +/- 169.37	-0.041
NPT10102AB	10/21/03	930	SP-2-NPTF	11/11/03	1,537	30.74	108,293	2,165.86	0.20	1,541	30.82	0.08 +/- 2.22	6.14 +/- 170.23	0.006
NPT10001AB	10/21/03	930	SP-1-NPTF	11/11/03	1,537	30.74	108,293	2,165.86	0.20	1,559	31.18	0.44 +/- 2.23	33.75 +/- 170.73	0.034
NPT10601AB	11/04/03	1040	SP-1-NPTF	11/11/03	1,537	30.74	108,293	2,165.86	0.20	1,612	32.24	1.5 +/- 2.24	115.06 +/- 172.19	0.115
NPT10701AB	11/04/03	1040	SP-2-NPTF	11/11/03	1,537	30.74	108,293	2,165.86	0.20	1,473	29.46	-1.28 +/- 2.19	-98.19 +/- 168.34	-0.098
NPT10702AB	11/04/03	1040	SP-2-NPTF	11/11/03	1,537	30.74	108,293	2,165.86	0.20	1,431	28.62	-2.12 +/- 2.18	-162.63 +/- 167.16	-0.163
NPT11201AB	12/02/03	1030	SP-1-NPTF	12/09/03	1,599	31.98	109,159	2,183.18	0.20	1,594	31.88	-0.1 +/- 2.26	-7.61 +/- 172.09	-0.008
NPT11202AB	12/02/03	1030	SP-1-NPTF	12/09/03	1,599	31.98	109,159	2,183.18	0.20	1,594	31.88	-0.1 +/- 2.26	-7.61 +/- 172.09	-0.008
NPT11301AB	12/02/03	1030	SP-2-NPTF	12/09/03	1,599	31.98	109,159	2,183.18	0.20	1,568	31.36	-0.62 +/- 2.25	-47.20 +/- 171.39	-0.047
NPT11801AB	01/07/04	1000	SP-1-NPTF	01/14/04	1,582	31.64	107,364	2,147.28	0.19	1,490	29.8	-1.84 +/- 2.22	-142.45 +/- 171.63	-0.142
NPT11802AB	01/07/04	1000	SP-1-NPTF	01/14/04	1,582	31.64	107,364	2,147.28	0.19	1,672	33.44	1.8 +/- 2.28	139.35 +/- 176.64	0.139
NPT11901AB	01/07/04	1000	SP-2-NPTF	01/14/04	1,582	31.64	107,364	2,147.28	0.19	1,601	32.02	0.38 +/- 2.26	29.42 +/- 174.71	0.029
NPT12401AB	02/18/04	1125	SP-1-NPTF	03/23/04	1,615	32.3	107,212	2,144.24	0.19	1,705	34.1	1.8 +/- 2.30	139.59 +/- 178.74	0.140
NPT12402AB	02/18/04	1125	SP-1-NPTF	03/23/04	1,615	32.3	107,212	2,144.24	0.19	1,611	32.22	-0.08 +/- 2.27	-6.20 +/- 176.19	-0.006
NPT12501AB	02/18/04	1125	SP-2-NPTF	03/23/04	1,615	32.3	107,212	2,144.24	0.19	1,609	32.18	-0.12 +/- 2.27	-9.31 +/- 176.14	-0.009
NPT13001AB	03/09/04	1050	SP-1-NPTF	03/23/04	1,615	32.3	107,212	2,144.24	0.19	1,689	33.78	1.48 +/- 2.30	114.78 +/- 178.31	0.115
NPT13101AB	03/09/04	1050	SP-2-NPTF	03/23/04	1,615	32.3	107,212	2,144.24	0.19	1,605	32.1	-0.2 +/- 2.27	-15.51 +/- 176.03	-0.016
NPT13102AB	03/09/04	1050	SP-2-NPTF	03/23/04	1,615	32.3	107,212	2,144.24	0.19	1,645	32.9	0.6 +/- 2.28	46.53 +/- 177.12	0.047
NPT13601AB	04/14/04	900	SP-1-NPTF	06/14/04	1,599	31.98	107,435	2,148.70	0.19	1,673	33.46	1.48 +/- 2.29	114.52 +/- 177.04	0.115
NPT13602AB	04/14/04	900	SP-1-NPTF	06/14/04	1,599	31.98	107,435	2,148.70	0.19	1,689	33.78	1.8 +/- 2.29	139.28 +/- 177.47	0.139
NPT13701AB	04/14/04	900	SP-2-NPTF	06/15/04	1,645	32.9	106,226	2,124.52	0.19	1,694	33.88	0.98 +/- 2.31	76.74 +/- 180.99	0.077
NPT14201AB	05/04/04	1000	SP-1-NPTF	06/15/04	1,645	32.9	106,226	2,124.52	0.19	1,577	31.54	-1.36 +/- 2.27	-106.50 +/- 177.79	-0.106
NPT14301AB	05/04/04	1000	SP-2-NPTF	06/15/04	1,645	32.9	106,226	2,124.52	0.19	1,583	31.66	-1.24 +/- 2.27	-97.10 +/- 177.96	-0.097
NPT14302AB	05/04/04	1000	SP-2-NPTF	06/15/04	1,645	32.9	106,226	2,124.52	0.19	1,627	32.54	-0.36 +/- 2.29	-28.19 +/- 179.17	-0.028
NPT14801AB	06/01/04	1000	SP-1-NPTF	06/16/04	1,650	33	107,235	2,144.70	0.19	1,693	33.86	0.86 +/- 2.31	66.70 +/- 179.38	0.067
NPT14901AB	06/01/04	1000	SP-2-NPTF	06/16/04	1,650	33	107,235	2,144.70	0.19	1,630	32.6	-0.4 +/- 2.29	-31.02 +/- 177.68	-0.031
NPT14902AB	06/01/04	1000	SP-2-NPTF	06/16/04	1,650	33	107,235	2,144.70	0.19	1,584	31.68	-1.32 +/- 2.27	-102.38 +/- 176.43	-0.102
NPT15501AB	07/13/04	1045	SP-2-NPTF	08/02/04	1,538	30.76	106,619	2,132.38	0.19	1,581	31.62	0.86 +/- 2.23	67.02 +/- 174.10	0.067
NPT15401AB	07/13/04	1045	SP-1-NPTF	08/02/04	1,538	30.76	106,619	2,132.38	0.19	1,552	31.04	0.28 +/- 2.22	21.82 +/- 173.28	0.022
NPT15402AB	07/13/04	1045	SP-1-NPTF	08/02/04	1,538	30.76	106,619	2,132.38	0.19	1,583	31.66	0.9 +/- 2.23	70.14 +/- 174.15	0.070
NPT16001AB	08/03/04	1000	SP-1-NPTF	08/17/04	1,497	29.94	106,217	2,124.34	0.19	1,583	31.66	1.72 +/- 2.22	134.51 +/- 173.60	0.135
NPT16101AB	08/03/04	1000	SP-2-NPTF	08/17/04	1,497	29.94	106,217	2,124.34	0.19	1,600	32	2.06 +/- 2.23	161.09 +/- 174.08	0.161
NPT16102AB	08/03/04	1000	SP-2-NPTF	08/17/04	1,497	29.94	106,217	2,124.34	0.19	1,529	30.58	0.64 +/- 2.20	50.05 +/- 172.07	0.050
NPT16601AB	09/07/04	1430	SP-1-NPTF	09/20/04	1,696	33.92	107,501	2,150.02	0.19	1,541	30.82	-3.1 +/- 2.28	-239.94 +/- 176.14	-0.240
NPT16701AB	09/07/04	1430	SP-1-NPTF	09/20/04	1,696	33.92	107,501	2,150.02	0.19	1,535	30.7	-3.22 +/- 2.27	-249.23 +/- 175.98	-0.249
NPT16702AB	09/07/04	1430	SP-2-NPTF	09/20/04	1,696	33.92	107,501	2,150.02	0.19	1,544	30.88	-3.04 +/- 2.28	-235.29 +/- 176.23	-0.235

cpm = counts per minute
dpm = disintegrations per minute

Table C-10. Results of liquid and air effluent rates from the New Pump and Treat Facility.

Date	Calculated PCE-Air (lb/hr)	Calculated PCE-Liquid (lb/hr)	Calculated TCE-Air (lb/hr)	Calculated TCE-Liquid (lb/hr)	Calculated cis-DCE-Air (lb/hr)	Calculated cis- DCE-Liquid (lb/hr)	Calculated trans-DCE- Air (lb/hr)	Calculated trans-DCE- Liquid (lb/hr)
10/21/03	0.00123	0.001863	0.011366	0.033338	0.000434	0.002353	0.000314	0.000981
11/04/03	0.00105	0.002475	0.011975	0.01532	0.000449	0.001768	0.000105	0.000589
12/02/03	0.001153	0.001074	0.011772	0.011453	0.000479	0.000931	0.00012	0.000358
01/07/04	0.004432	0.001696	0.01096	0.015753	0.000434	0.001212	0.000105	0.000364
02/18/04	0.004662	0.001063	0.014004	0.011813	0.001348	0.000709	0.000225	0.000236
03/09/04	0.000999	0.001483	0.009742	0.015966	0.000374	0.001254	0.000284	0.000456
04/14/04	0.001383	0.001398	0.009133	0.01573	0.000404	0.000932	0.000117	0.00035
05/04/04	0.00082	0.001615	0.007104	0.017308	0.000388	0.001154	0.000249	0.000462
06/01/04	0.001025	0.001186	0.008119	0.013681	0.000388	0.000821	0.000147	0.000274
07/13/04	0.001153	0.001093	0.00893	0.010015	0.000419	0.000728	0.000198	0.000273
08/03/04	0.001281	0.001053	0.012584	0.008426	0.000898	0.000702	0.000358	0.000281
09/07/04	0.000789	0.000961	0.007104	0.009605	0.000584	0.00048	0.000252	0.000192

Appendix D

Water Quality Data
for Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44

Appendix D

Water Quality Data for Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44

Water quality data for Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44 are shown in Tables D-1 and D-2.

Table D-1. Volatile organic compound data at Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44.

Well	Date	PCE		TCE		<i>cis</i> -1,2- DCE		<i>trans</i> -1,2- DCE		VC	
		(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag
TAN-29	11/10/03	23	—	650	D	85	—	44	—	2	J
	11/10/03	23	—	690	D	90	—	48	—	2	J
	01/12/04	14.9	—	870	D	136	D	91.3	D	4.4	
	05/17/04	21	—	770	J	100	—	28	—	2	U
	07/19/04	18.6	D	610	D	73.4	D	13.3	D	10	U
TAN-33	01/14/04	11.4	—	92.8	—	3.2	—	1.2	—	1	U
	07/21/04	9.9	J	79.6	—	3.0	—	1.1	J	1	U
TAN-36	01/14/04	2.4	—	34.3	—	1.6	—	0.72	J	1	U
	07/21/04	3.3	J	40.7	—	1.9	—	0.67	J	1	U
TAN-43	01/14/04	11.1	—	106	D	4.3	—	1.3	—	1	U
	01/14/04	10.8	—	108	D	4.5	—	1.4	—	1	U
	07/21/04	12.2	J	134	DJ	4.5	—	1.3	J	—	—
TAN-44	01/14/04	4.4	—	48.4	—	2	—	0.83	J	1	U
	07/21/04	3.8	J	42.1	—	1.9	—	0.46	J	1	U

D = duplicate sample; J = estimated value; U = nondetect

DCE = dichloroethene

PCE = tetrachloroethene

TAN = Test Area North

TCE = trichloroethene

VC = vinyl chloride

Table D-2. Radiological data at Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44.

Well	Date	H-3		Sr-90		Minimum Detectable Activity	Gross Alpha		Gross Beta	
		(pCi/L)	+/-	(pCi/L)	+/-		(pCi/L)	+/-	(pCi/L)	+/-
TAN-29	01/12/04	3,250	144	33.5	4.15	0.756	-5.12	10.24	255.343	175.66
	07/19/04	2,080	128	6.59	0.919	0.47	75.94	3.83	52.99	173.84
	08/24/04	2,800	123	42.1	7.94	13.2	—	—	—	—
TAN-33	01/14/04	2,160	127	0.152	0.181	0.766	28.27	23.02	154.75	173.88
	07/21/04	1,750	112	0.0507	0.1	0.44	75.89	3.83	51.44	173.82
TAN-36	01/14/04	2,500	134	0.172	0.165	0.691	31.74	15.99	145.47	173.71
	07/21/04 ^a	1,860	131	-0.146	0.0963	0.478	b	b	b	b
	07/21/04 ^a	2,000	128	0.134	0.0965	0.392	b	b	b	b
TAN-43	01/14/04 ^a	2,770	136	0.0707	0.171	0.746	-9.09	11.61	94.26	175.34
	01/14/04 ^a	2,470	132	0.122	0.159	0.676	12.12	14.85	98.90	175.43
	07/21/04	2,110	130	0.19	0.119	0.47	b	b	b	b
TAN-44	01/14/04	2,610	132	0.0426	0.17	0.745	-15.14	18.83	89.62	175.26
	07/21/04	1,960	117	0.267	0.134	0.503	74.49	3.80	6.23	173.00

^a. Duplicate sample
^b. Sample lost due to freezing in refrigerator
TAN = Test Area North